

In July (Map 7, the effect of continental cooling is evident, and the continental core has lower PE than any point near the coast. This is the month of lowest PE in the State. It is worth noting that Wyndham still reaches the total of over 9 em. for the month.

In September (Map 8) a loop of high PE begins to appear in the north, with a tendency to spread towards the Hamersley area. The area of low PE because of continental cooling is now limited to a small region between Northam, Wagin and Southern Cross, but a relatively low PE (5 em.) is found as far north as Murgoo and Cue. In November (Map 9) the hot loop has divided into two rings, one around Wyndham, the other one in the North-west, where it will reach its greatest development in January. The heating up of the continental interior now brings high PE southwards, for instance 11 cm. at Kalgoorlie, while the ocean keeps PE low near the coast, where even Carnarvon has less than 11 cm. PE.

The small low-lying area around Wyndham has over eight months with a PE above 15 em. (Map 10). The Pilbarra district follows with over seven months. The South-west from Geraldton to York and eastwards past Kalgoorlie has less than one month with such a high PE. A similar pattern is disclosed by Map 11, which shows the number of months with a PE over 10 cm. The great difference between South-west and North-west is still apparent. Map 12 shows the number of months with PE above 5 cm.; the pattern is quite different, with the far South-west coast and South-east having more than eight months with such a PE, and Murgoo, Cue and other relatively northerly localities having less than eight months, probably because of the cooling effect of continental winter.

(The place names on the maps are indicated by the following initials: H., Hall's Creek; W., Wiluna; K., Kalgoorlie; and P., Perth.)

(To be continued)

REPORTS OF EXCURSIONS

LAKE LESCHENAULTIA

The excursion of Western Australian Naturalists' Club members to Lake Leschenaultia on April 4, 1948 was well attended and general observations on the flora and fauna of the lake and surrounding bushland were carried out.

The lake is an artificial one, being the dammed up headwaters of Cookes Brook which flows in a northerly direction into the Wooroloo Brook and thence into the Avon River. It covers an area of 62 acres when full and is 938 feet above sea-level, being about one mile from Chidlow. The dam was surveyed in 1910 and completed in 1912 for the W.A. Government Railways as a source of water for the department's locomotives. However owing to its variable salinity, which at times reaches 60 grains per gallon, and that it has proved more economical to draw water supplies from the Goldfields Water Supply pipeline, the dam has had little use.

It has never been known to be empty and at the excursion the level was about 6 feet below the spill-way. A water sample collected was analysed by Mr. R. Spencer, of the C.S.I.R.; the salinity was 0.62 gm. per litre (= 43 grains per gallon); nitrate nitrogen, 10 parts per million; phosphate phosphorus, trace only.

The water was extremely clear and this appeared to be due to the presence in abundance of two species of stoneworts (Characeae) growing in the bed of the lake. This group of algae appears to have water-clearing properties not readily explainable. In the south-west corner, where the run-in comes from the town, pondweed (*Potamogeton tricarinata*) was growing in association with the stoneworts in a layer of fine detritus up to 18 inches deep. In the shallow water around the margins were belts of reeds, *Leptocarpus coangustatus*, *Typha angustifolia* and *Juncus pallidus*.

No native fishes were found, the lake apparently containing only English Perch (*Perca fluviatilis*) and *Gambusia affinis*. Several hauls were made with a plankton net, 40 cm. in diameter, made of silk bolting cloth 16 meshes per linear cm. Poor catches were obtained, composed of Cladocera (*Ceriodaphnia* sp.), two species of Copepoda, at least one Ostracod and an Amphipod. The detritus was composed largely of discarded pupal cases of mayflies, several larvae of which were in the plankton. Under stones at the water's edge were small jilgies (*Chaeraps quinquecarinatus*) while below the wall of the dam were quite large numbers of mud-eyes (dragonfly pupae) caught by the junior members.

Miss N. Kniep, who made a botanical record of the excursion, reported few plants in bloom. The orange-red flowers of *Adenanthos barbiger* were glimpsed at the edge of the lake and others noted were several of the creamy-flowered prickly hakeas (including *Hakea varia*, *H. prostrata*, *H. bipinnatifida* and *H. undulata*) the blue-flowered *Lobelia anceps* in the marshy ground, the blue summer-flowering *Pronaya elegans*, the camphor myrtle (*Baecka camphorosma*) with its cameo-pink sprays, the mauve *Dichopogon strictus* and white-beards (*Leucopogon oxycedrus*). Among the taggards at the end of their flowering period were a Michaelmas daisy (*Olearia paucidentata*) and a lesser relative of the Albany southern cross (*Xanthosia peltigera*). In bud were found plants of *Hovca chorizemifolia*—one of the earliest of the winter-flowering plants—*Acacia nervosa*, *A. pulchella* and *A. Hucgellii*. Many new shoots of *Leschenaultia biloba* were evident on the rise near the lake.

The ornithologists reported a poor bird list. About 20 Little Pied Cormorants were flying over the upper end of the lake, evidently disturbed from their roosting place by the several picnickers there. The only other water-bird was a single Little Grebe. Probably the most frequently seen land-bird was the Grey Fantail, and others noted were the Treemartin, Scarlet Robin, Western Shrike-thrush, Western Warbler, Western and Brown Thornbills, Banded Blue-wren (no fully plumaged males seen) and the Red-tipped Diamond-bird.

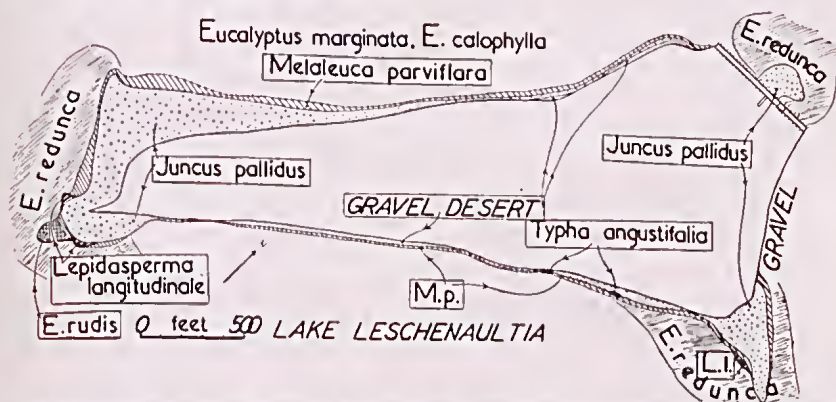
—BRUCE SHIPWAY, South Perth.

MICRO-GEOGRAPHY OF LAKE LESCHENAULTIA

The damming up of the small creek which now forms Lake Leschenaultia, near Chidlow, has had a far-reaching effect on the topography and the vegetation of the area—a new micro-geographical world has developed.

The topography originally consisted of three slopes, two running from south-west to north-west, facing each other for about 2,500 feet each, and the third one from south-south-east to north-north-west extending along 1,000 feet or so. A small creek flowed in the shallow valley between the opposite slopes, and was joined on the right bank by a much smaller creek flowing roughly from the south-east. The flowing of the creeks was limited to the rainy season or little longer. The original vegetation of the slopes, covered with lateritic gravel, consisted of mixed forest of jarrah (*Eucalyptus marginata*) and marri (*E. calophylla*) with the usual undergrowth. Along the creek flats the fine clay carried by the water favoured the growth of wandoo (*E. redunca*).

The damming of the valley produced a permanent pool of water, and gradually a new type of vegetation colonised the new environment. But besides favouring the establishment of water-loving vegetation the dam checked the speed of flowing water so that a much heavier deposition of clay and silt resulted. Consequently there is a spread of wandoo upstream of the lake near both creeks, where the flow of water slows down but there is no stagnation, as shown on the map.



The water-loving plants could not colonise the very poor lateritic gravel of the lower slopes when these slopes became the shores of the lake. This is evidenced by the narrow strips of gravel desert shown on the map. The extent of the desert is chiefly controlled by the slope. Where the slope is steep, deposition of silt is almost impossible so that water-loving plants cannot gain a foothold, while at the same time the rise of the water-table in winter kills the usual vegetation of the gravelly slopes.

The silted areas subject to long periods of flooding and with the water-table never far from the surface are now covered with pallid reed (*Juncus pallidus*), shown by dots on the map. The pallid reed reaches to a level of about two feet above the lowest water level.

Between two and three feet above the lowest water level is a narrow belt of small-flowered paperbark (*Melaleuca parviflora*) with an undergrowth of thin grass-reed (*Leptocarpus coangustus*). The paperbark and the grass-reed are well established on the north-western side of the lake, as shown by the diagonal rules on the map. The paperbark is more widespread on the western side. Its larger size makes it a more exacting plant and a slower one to colonise a new environment. Most of the specimens are still quite young. The south-eastern slope, which is steeper in the vicinity of the water, carries much thinner belts of these plants (shown by the initials M.p. and the diagonal rules on the map).

Just on the outside of the *Melaleuca-Leptocarpus* belt is usually found near similar lakes a belt of flat-leaved sedge (*Lepidosperma longitudinale*). Near Lake Lesehenaultia, so far as this rapid survey disclosed, this flat-leaved sedge has only colonised three small areas, shown by thick diagonal lines on the map. Two of these areas are at the south-east corner of the lake, one on each side of the creek. The third area, shown by the initials L.L., is near the north-eastern side of the lake, near the smaller creek. The reason for this remarkable coincidence is worth investigating—it might be due to a differential deposition of silt by the creeks, slightly coarser material being deposited at flood time where *Lepidosperma* now grows.

Exactly due south of the dam are two very small colonies of yanget (*Typha angustifolia*) which appear to be very recent. They are shown in black on the map.

On the recently formed low-lying islands in the bed of the main creek, within reach of the water-table but not actually in the water, is a young and growing colony of flooded gum (*Eucalyptus rudis*).

Thanks are expressed to Mr. R. D. Royce for the determination of botanical species.

—J. GENTILLI, University of W.A., Nedlands.

FROM FIELD AND STUDY

Piracy in the Silver Gull.—While watching sea-birds at Rose Bay, Sydney, I saw a Crested Tern (*Sterna bergii*) pursued by a Silver Gull (*Larus novae-hollandiae*). The tern dropped a small fish which was immediately seized from the surface by the gull. A few minutes later a Silver Gull was seen closely pursuing another Crested Tern.

A third pursuit was very prolonged and determined, but the tern apparently retained the prey which it was carrying.

The impression that I gained from the foregoing three observations was that the Silver Gull (or gulls) was practising deliberate piracy. I have no recollection of this behaviour having been attributed to this species, though it is well-recognised as a characteristic of the skuas.

—ERIC H. SEDGWICK, Caron.